Air Quality Permitting
Technical Memorandum

January 17, 2003

TIER II Operating Permit and Permit to Construct No. 001-00027

Saint Alphonsus Regional Medical Center
Boise, Idaho

Project No. T2-000730

Prepared By:

Kent Berry
Environmental Quality Management, Inc.

FINAL PERMIT

TABLE OF CONTENTS

ACRONYMS, UNITS AND CHEMICAL NOMENCLATURE

AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
EPA	Environmental Protection Agency
HAPs	Hazardous Air Pollutants
IDAPA	A numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
kW	kilowatt
MACT	Maximum Available Control Technology
MMBtu/hr	million British thermal units per hour
NAAQS	National Ambient Air Quality Standards
NESHAP	Nation Emission Standards for Hazardous Air Pollutants
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
PAH	Polycyclic Aromatic Hydrocarbon
PM_{10}	particulate matter with an aerodynamic diameter of 10 micrometers or less
PSD	Prevention of Significant Deterioration
PTC	permit to construct
SARMC	Saint Alphonsus Regional Medical Center
SIP	State Implementation Plan
SM	synthetic minor
SO_2	sulfur dioxide
TAPs	toxic air pollutants
T/yr	tons per year
VOC	volatile organic compound

PURPOSE

The purpose for this memorandum is to satisfy the requirements of the *Rules for the Control of Air Pollution in Idaho*, IDAPA 58.01.01.200-228 and IDAPA 58.01.01.400-470, for issuing permits to construct and Tier II operating permits.

PROJECT DESCRIPTION

Saint Alphonsus Regional Medical Center (SARMC) is proposing to renew their Tier II operating permit and increase the operating hours for burning No. 2 fuel oil in their boilers. Also, four new emergency generators and three small boilers are being included.

The emission sources covered by the permit are as follows:

Table 1.1 REGULATED EMISSION SOURCES

Permit Section	Source Description	Emissions Control(s)
3	Boiler No. 1 – Cleaver Brooks Natural gas-fired, No. 2 fuel oil back up 31.5 MMBtu/hr rated heat input capacity Model: D-52; installed 1972	None
3	Boiler No. 2 – Cleaver Brooks Natural gas-fired, No. 2 fuel oil back up 31.5 MMBtu/hr rated heat input capacity Model: D-52; installed 1972	None
3	Boiler No. 3 – Cleaver Brooks Natural gas-fired, No. 2 fuel oil back up 12.8 MMBtu/hr rated heat input capacity Model: D-26, installed 1980	None
3	Boiler No. 5 – Bryan Steam Natural gas-fired, No. 2 fuel oil back up 5.0 MMBtu/hr rated heat input capacity Model: RV-500; installed 1993	None
3	M0BV1 Boilers No. 1 and 2, 1.8 MMBtu/hr each Lochinvar CHN 1800; installed 2001 MOBV1 Boiler No. 3, 500,000 Btu/hr, Lochinvar CFN501PM; installed 2001	None None
4	Emergency Generator No. 1 – Caterpillar Diesel-fired, 675 kW rated output capacity, Model: D398	None
4	Emergency Generator No. 2 – Caterpillar Diesel-fired, 750 kW rated output capacity, Model: D349-SRCR	None
4	Emergency Generator No. 3 – Kohler Diesel-fired, 300 kW rated output capacity, Model: 300 R0Z0	None
4	Emergency Generator No. 4 – Detroit Diesel Diesel-fired, 750 kW rated output capacity, Model: 573RS17034BP	None
4	Emergency Generator No. 5 – Kohler Diesel-fired, 80 kW rated output capacity, Model: 80R0ZJ81	None
4	Emergency Generator No. 6 – Koehler Diesel-fired, 600 kW rated output capacity, Model: 600R0ZD71	None
4	Emergency Generator No. 7 – Kohler Diesel fired, 200 kW, Model: 200 ROZD	None
4	Emergency Generator No. 8 – Kohler Diesel-fired, 600 kW, Model: 600ROZD-4	None
4	Emergency Generator No. 9 – Kohler Diesel-fired, 30 kW, Model: 30 RE0ZJB	None

FACILITY DESCRIPTION

The air emission sources at SARMC consists of four No. 2 oil- and natural gas-fired boilers, three smaller gas-fired boilers, and nine emergency generators, as listed in Table 1.1.

SUMMARY OF EVENTS

January 16, 2001	SARMC requested changes and a renewal to Tier II Operating Permit No. 001-00027, issued January 22, 1996, to increase the number of hours No. 2 fuel oil could be burned in the boilers.
October 18, 2001	DEQ determined the application to be incomplete.
December 28, 2001	SARMC submitted a response to the incompleteness determination.
March 8, 2002	Since this response indicated that new emergency generators were being installed, DEQ issued a second incompleteness letter.
April 4, 2002	SARMC submitted additional information.
April 30, 2002	DEQ determined the application complete.
October 10, 2002	DEQ issued a draft permit for facility review. No comments were received.
November 22, 2002	DEQ issued a proposed permit for public comment.
December 6, 2002	30 day public comment period begins.
January 6, 2003	Public comment period ends. No public comments were received and there was no request for a public hearing.

PERMIT HISTORY

The following is a summary of the permit files available to Environmental Quality Management.

January 22, 1996	The original Tier II operating permit was issued.
March 15, 1996	The permit was revised.
October 15, 1998	A PTC was issued for replacement of emergency generator sets Nos. 3 and 5 with new generator No. 8.
February 12, 1999	A PTC exemption was issued for generator No.8 which voided the October 15, 1998 PTC.
April 3, 1998	A PTC exemption was issued for the ethylene oxide sterilizer.
January 22, 2001	The Tier II operating permit expired.

DISCUSSION

1. Emission Estimates

Emission estimates for all the current equipment, using the latest EPA emission factors, are presented in Appendix A.

2. Modeling

A dispersion modeling analysis for all boilers and emergency generators was conducted by EQM using the ISC Prime model. As shown in Appendix B, the facility will not cause or contribute to a violation of any NAAQS or acceptable ambient concentration for any toxic air pollutant in IDAPA 58.01.01.586 under the operating-hour limits in the permit.

3. Facility Classification

The SARMC is not a major facility as defined in IDAPA 58.01.01.008. This AIRS classification for this facility is SM, which is defined as a synthetic minor facility with actual and potential emissions of regulated air pollutants below major source thresholds, only if it complies with the federally enforceable conditions in this permit.

4. Area Classification

SARMC is located in Boise, Idaho, which is in Ada County and Air Quality Control Region 64. Ada County is designated as nonattainment for CO and unclassified for all other criteria air pollutants.

5. Regulatory Review

IDAPA 58.01.01.201 Permit to Construct Required

This project involves the modification of boilers No. 1, 2, 3, and 5 to increase the allowable annual hours of operation when firing diesel fuel from 48 hours per boiler to 360 hours per year each. This modification triggers permit to construct requirements that are incorporated into this Tier II permit renewal action.

IDAPA 58.01.01.210 Demonstration of Preconstruction Compliance with Toxic Standards

The increase in the number of hours of operation for burning No.2 fuel oil in the boilers does not change the hourly emissions rate of the TAPs. The addition of four new emergency generators requires a TAP analysis for these sources. The emission screening levels in IDAPA 58.01.01.585 and 586 were exceeded for the following five TAPs: PAH; benzene; 1, 3 - butadiene; formaldehyde; and acetaldehyde. A modeling analysis was conducted for these pollutants as discussed in Section 2. The analysis demonstrates that this modification complies with the toxic standards specified in IDAPA 58.01.01.210. Details of the analysis can be found in Appendix B.

IDAPA 58.01.01.401 thru 470 Tier II Operating Permit

The SARMC operates under Tier II Operating Permit No. 001-00027. This permit was originally issued January 22, 1996, and expired January 22, 2001. This action is for the modification and renewal of this operating permit.

IDAPA 58.01.01.577 Ambient Air Quality Standards for Specific Air Pollutants

40 CFR 52 Prevention of Significant Deterioration (PSD)

PSD requirements do not apply to SARMC because it is not a major facility as defined in IDAPA 58.01.01.008.10.

40 CFR 60 — New Source Performance Standards (NSPS)

No NSPS apply to units at SARMC.

40 CFR 61 & 63 — National Emission Standards for Hazardous Air Pollutants and Maximum Achievable Control Technology

No subparts of 40 CFR 61 or 63 are applicable to units at SARMC.

6. Permit Requirements

6.1 Emissions Limits

Due to the increase in the number of operating hours burning No.2 fuel oil in the boilers, the annual emission limits for the boilers are increased. The emission limits for the boilers and existing emergency generators have been revised to reflect the latest EPA emission factors. The emission limits for the emergency generators also include the new generators. Emission limits have been set only for those pollutants whose potential emissions exceed 10% of the significant emission rates at IDAPA 58.01.01.006.92. Compliance with the operating-hour limits (see Section 6.2) will ensure compliance with the emission limits. The grain-loading limit for the emergency generators in the previous Tier II permit has been deleted because the diesel engines do not meet the definition of fuel-burning equipment in IDAPA 58.01.01.006.41.

6.2 Operating Requirements

The natural gas-consumption limit and requirement to monitor and record the natural gas consumption in the previous Tier II permit have been deleted because allowable emissions are based on the maximum capacity and operating hours of the equipment. The operating hours for use of No. 2 fuel oil in the boilers have been increased to 360 hours per year each. Other operating requirements remain unchanged. See Permit Conditions 3.4 through 3.8.

7. AIRS Information

AIRS/AFS[a] FACILITY-WIDE CLASSIFICATION[b] DATA ENTRY FORM

AIR PROGRAM / POLLUTANT	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	TITLE V	AREA CLASSIFICATION A – Attainment U – Unclassifiable N – Nonattainment
SO_2	SM					SM	A
NO_x	SM					SM	U
CO	SM					SM	N
PM_{10}	B						U
PT (Particulate)	B						A
VOC	B						U
THAP (Total HAPs)	NA						NA
			APPLICABLE SUBPART				

[a] Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

[b] AIRS/AFS Classification Codes:

A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For NESHAP only, class "A" is applied to each pollutant which is below the 10 T/yr threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.

SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.

B = Actual and potential emissions below all applicable major source thresholds.

C = Class is unknown.

ND = Major source thresholds are not defined (e.g., radionuclides).

FEES

Fees apply to this facility in accordance with IDAPA 58.01.01.470 at the time the Tier II application was being processed. The required fee payment is $500.00. The facility will be notified of the required fee when the final permit is issued.

RECOMMENDATION

Based on the review of the application materials and all applicable state and federal regulations, staff recommends DEQ issue a final Tier II operating permit and permit to construct to SARMAC. An opportunity for public comment on the air quality aspects of the proposed permit was provided in accordance with IDAPA 58.01.01.404.01.c.

KB/MS:sm G:\Air Quality\Stationary Source\SS Ltd\T2\St Als\Final Prep\T2-010115 St Als Final TM.doc

cc: Mike McGown, Boise Regional Office

APPENDIX A

POTENTIAL EMISSION ESTIMATES

Potential Emissions from Boilers
Saint Alphonsus Medical Center

Source ID	Rated Capacity (MMBtu/hr)	Rated Capacity (MMscf/hr)	Fuel Rate (1000 gal/hr)	Fuel Type	Operating Hours* (hr/yr)	Potential Hourly Emissions PM (lb/hr)	PM10 (lb/hr)	SO_2 (lb/hr)	VOC (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	PAH (lb/hr)
# 1 (Nat. Gas)	31.5	3.09E-02		Nat. Gas	8400	2.35E-01	2.35E-01	1.85E-02	1.70E-01	1.54E+00	2.59E+00	2.16E-05
# 1 (Fuel Oil)			2.28E-01	Fuel Oil	360	7.53E-01	3.77E-01	1.62E+01	4.57E-02	4.57E+00	1.14E+00	1.38E-05
# 1 Maximum						***7.53E-01***	***3.77E-01***	***1.62E+01***	***1.70E-01***	***4.57E+00***	***2.59E+00***	***2.16E-05***
# 2 (Nat. Gas)	31.5	3.09E-02		Nat. Gas	8400	2.35E-01	2.35E-01	1.85E-02	1.70E-01	1.54E+00	2.59E+00	2.16E-05
# 2 (Fuel Oil)			2.28E-01	Fuel Oil	360	7.53E-01	3.77E-01	1.62E+01	4.57E-02	4.57E+00	1.14E+00	1.38E-05
# 2 Maximum						***7.53E-01***	***3.77E-01***	***1.62E+01***	***1.70E-01***	***4.57E+00***	***2.59E+00***	***2.16E-05***
# 3 (Nat. Gas)	12.8	1.25E-02		Nat. Gas	8400	9.54E-02	9.54E-02	7.53E-03	6.90E-02	6.27E-01	1.05E+00	8.76E-06
# 3 (Fuel Oil)			9.28E-02	Fuel Oil	360	3.06E-01	1.53E-01	6.59E+00	1.86E-02	1.86E+00	4.64E-01	5.62E-06
# 3 Maximum						***3.06E-01***	***1.53E-01***	***6.59E+00***	***6.90E-02***	***1.86E+00***	***1.05E+00***	***8.76E-06***
# 5 (Nat. Gas)	5.0	4.90E-03		Nat. Gas	8400	3.73E-02	3.73E-02	2.94E-03	2.70E-02	2.45E-01	4.12E-01	3.42E-06
# 5 (Fuel Oil)			3.62E-02	Fuel Oil	360	1.20E-01	5.98E-02	2.57E+00	7.25E-03	7.25E-01	1.81E-01	2.19E-06
# 5 Maximum						***1.20E-01***	***5.98E-02***	***2.57E+00***	***2.70E-02***	***7.25E-01***	***4.12E-01***	***3.42E-06***
MOB VI #1**	1.8	1.76E-03	NA	Nat. Gas	8760	1.34E-02	1.34E-02	1.06E-03	9.71E-03	8.82E-02	1.48E-01	1.23E-06
MOB VI #2**	1.8	1.76E-03	NA	Nat. Gas	8760	1.34E-02	1.34E-02	1.06E-03	9.71E-03	8.82E-02	1.48E-01	1.23E-06
MOB VI #3**	0.5	4.90E-04	NA	Nat. Gas	8760	3.73E-03	3.73E-03	2.94E-04	2.70E-03	2.45E-02	4.12E-02	3.42E-07
MOB TOTAL						***3.05E-02***	***3.05E-02***	***2.41E-03***	***2.21E-02***	***2.01E-01***	***3.38E-01***	***2.81E-06***
GRAND TOTAL[2]						**1.98E+00**	**9.97E-01**	**4.16E+01**	**4.58E-01**	**1.19E+01**	**6.99E+00**	**5.81E-05**

Sulfur content of fuel oil = 0.5 %

* Fuel oil usage resticted to 360 hr/yr

** New Equipment

1. Natural Gas Emission factors per 5th Edition AP-42, 1.4 Natural Gas Combustion (7-98)
   Fuel Oil Emission Factors per 5th Edition AP-42, 1.3 Fuel Oil Combustion (9-98)
2. Sum of maximum emission rates

Potential Emissions from Boilers
Saint Alphonsus Medical Center

	Potential Hourly Emissions							
Source ID	Benzene	Ethylbenzene	Formaldehyde	Napthalene	Hexane	Pentane	Toluene	o-Xylene
	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
# 1 (Nat. Gas)	6.49E-05	0.00E+00	2.32E-03	0.00E+00	5.56E-02	8.03E-02	1.05E-04	0.00E+00
# 1 (Fuel Oil)	4.88E-05	1.45E-05	7.53E-03	2.58E-04	0.00E+00	0.00E+00	1.42E-03	2.49E-05
# 1 Maximum	***6.49E-05***	***1.45E-05***	***7.53E-03***	***2.58E-04***	***5.56E-02***	***8.03E-02***	***1.42E-03***	***2.49E-05***
# 2 (Nat. Gas)	6.49E-05	0.00E+00	2.32E-03	0.00E+00	5.56E-02	8.03E-02	1.05E-04	0.00E+00
# 2 (Fuel Oil)	4.88E-05	1.45E-05	7.53E-03	2.58E-04	0.00E+00	0.00E+00	1.42E-03	2.49E-05
# 2 Maximum	***6.49E-05***	***1.45E-05***	***7.53E-03***	***2.58E-04***	***5.56E-02***	***8.03E-02***	***1.42E-03***	***2.49E-05***
# 3 (Nat. Gas)	2.64E-05	0.00E+00	9.41E-04	0.00E+00	2.26E-02	3.26E-02	4.27E-05	0.00E+00
# 3 (Fuel Oil)	1.98E-05	5.90E-06	3.06E-03	1.05E-04	0.00E+00	0.00E+00	5.75E-04	1.01E-05
# 3 Maximum	***2.64E-05***	***5.90E-06***	***3.06E-03***	***1.05E-04***	***2.26E-02***	***3.26E-02***	***5.75E-04***	***1.01E-05***
# 5 (Nat. Gas)	1.03E-05	0.00E+00	3.68E-04	0.00E+00	8.82E-03	1.27E-02	1.67E-05	0.00E+00
# 5 (Fuel Oil)	7.75E-06	2.30E-06	1.20E-03	4.09E-05	0.00E+00	0.00E+00	2.25E-04	3.95E-06
# 5 Maximum	***1.03E-05***	***2.30E-06***	***1.20E-03***	***4.09E-05***	***8.82E-03***	***1.27E-02***	***2.25E-04***	***3.95E-06***
MOB VI #1**	3.71E-06	0.00E+00	1.32E-04	0.00E+00	3.18E-03	4.59E-03	6.00E-06	0.00E+00
MOB VI #2**	3.71E-06	0.00E+00	1.32E-04	0.00E+00	3.18E-03	4.59E-03	6.00E-06	0.00E+00
MOB VI #3**	1.03E-06	0.00E+00	3.68E-05	0.00E+00	8.82E-04	1.27E-03	1.67E-06	0.00E+00
MOB TOTAL	***8.44E-06***	***0.00E+00***	***3.01E-04***	***0.00E+00***	***7.24E-03***	***1.05E-02***	***1.37E-05***	***0.00E+00***
GRAND TOTAL[1]	**1.75E-04**	**3.72E-05**	**1.96E-02**	**6.62E-04**	**1.50E-01**	**2.16E-01**	**3.64E-03**	**6.38E-05**

Potential Emissions from Boilers
Saint Alphonsus Medical Center

	Potential Hourly Emissions												
Source ID	Arsenic	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
# 1 (Nat. Gas)	6.18E-06	3.71E-07	3.40E-05	4.32E-05	2.59E-06	2.63E-05	0.00E+00	1.17E-05	7.41E-06	6.49E-05	7.41E-07	7.10E-05	8.96E-04
# 1 (Fuel Oil)	1.26E-04	9.45E-05	9.45E-05	9.45E-05	0.00E+00	1.89E-04	2.84E-04	1.89E-04	9.45E-05	9.45E-05	4.73E-04	0.00E+00	1.26E-04
# 1 Maximum	***1.26E-04***	***9.45E-05***	***9.45E-05***	***9.45E-05***	***2.59E-06***	***1.89E-04***	***2.84E-04***	***1.89E-04***	***9.45E-05***	***9.45E-05***	***4.73E-04***	***7.10E-05***	***8.96E-04***
# 2 (Nat. Gas)	6.18E-06	3.71E-07	3.40E-05	4.32E-05	2.59E-06	2.63E-05	0.00E+00	1.17E-05	7.41E-06	6.49E-05	7.41E-07	7.10E-05	8.96E-04
# 2 (Fuel Oil)	1.26E-04	9.45E-05	9.45E-05	9.45E-05	0.00E+00	1.89E-04	2.84E-04	1.89E-04	9.45E-05	9.45E-05	4.73E-04	0.00E+00	1.26E-04
# 2 Maximum	***1.26E-04***	***9.45E-05***	***9.45E-05***	***9.45E-05***	***2.59E-06***	***1.89E-04***	***2.84E-04***	***1.89E-04***	***9.45E-05***	***9.45E-05***	***4.73E-04***	***7.10E-05***	***8.96E-04***
# 3 (Nat. Gas)	2.51E-06	1.51E-07	1.38E-05	1.76E-05	1.05E-06	1.07E-05	0.00E+00	4.77E-06	3.01E-06	2.64E-05	3.01E-07	2.89E-05	3.64E-04
# 3 (Fuel Oil)	5.12E-05	3.84E-05	3.84E-05	3.84E-05	0.00E+00	7.68E-05	1.15E-04	7.68E-05	3.84E-05	3.84E-05	1.92E-04	0.00E+00	5.12E-05
# 3 Maximum	***5.12E-05***	***3.84E-05***	***3.84E-05***	***3.84E-05***	***1.05E-06***	***7.68E-05***	***1.15E-04***	***7.68E-05***	***3.84E-05***	***3.84E-05***	***1.92E-04***	***2.89E-05***	***3.64E-04***
# 5 (Nat. Gas)	9.80E-07	5.88E-08	5.39E-06	6.86E-06	4.12E-07	4.17E-06	0.00E+00	1.86E-06	1.18E-06	1.03E-05	1.18E-07	1.13E-05	1.42E-04
# 5 (Fuel Oil)	2.00E-05	1.50E-05	1.50E-05	1.50E-05	0.00E+00	3.00E-05	4.50E-05	3.00E-05	1.50E-05	1.50E-05	7.50E-05	0.00E+00	2.00E-05
# 5 Maximum	***2.00E-05***	***1.50E-05***	***1.50E-05***	***1.50E-05***	***4.12E-07***	***3.00E-05***	***4.50E-05***	***3.00E-05***	***1.50E-05***	***1.50E-05***	***7.50E-05***	***1.13E-05***	***1.42E-04***
MOB VI #1**	3.53E-07	2.12E-08	1.94E-06	2.47E-06	1.48E-07	1.50E-06	0.00E+00	6.71E-07	4.24E-07	3.71E-06	4.24E-08	4.06E-06	5.12E-05
MOB VI #2**	3.53E-07	2.12E-08	1.94E-06	2.47E-06	1.48E-07	1.50E-06	0.00E+00	6.71E-07	4.24E-07	3.71E-06	4.24E-08	4.06E-06	5.12E-05
MOB VI #3**	9.80E-08	5.88E-09	5.39E-07	6.86E-07	4.12E-08	4.17E-07	0.00E+00	1.86E-07	1.18E-07	1.03E-06	1.18E-08	1.13E-06	1.42E-05
MOB TOTAL	***8.04E-07***	***4.82E-08***	***4.42E-06***	***5.63E-06***	***3.38E-07***	***3.42E-06***	***0.00E+00***	***1.53E-06***	***9.65E-07***	***8.44E-06***	***9.65E-08***	***9.25E-06***	***1.17E-04***
GRAND TOTAL[2]	**3.24E-04**	**2.42E-04**	**2.47E-04**	**2.48E-04**	**6.99E-06**	**4.88E-04**	**7.27E-04**	**4.86E-04**	**2.43E-04**	**2.51E-04**	**1.21E-03**	**1.91E-04**	**2.41E-03**

Potential Emissions from Boilers
Saint Alphonsus Medical Center

Source ID	Potential Annual Emissions						
	PM	PM10	SO_2	VOC	NO_x	CO	PAH
	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)
# 1 (Nat. Gas)	9.86E-01	9.86E-01	7.78E-02	7.13E-01	6.49E+00	1.09E+01	9.06E-05
# 1 (Fuel Oil)	1.36E-01	6.78E-02	2.92E+00	8.22E-03	8.22E-01	2.05E-01	2.49E-06
# 1 Maximum	***1.12E+00***	***1.05E+00***	***2.99E+00***	***7.22E-01***	***7.31E+00***	***1.11E+01***	***9.30E-05***
# 2 (Nat. Gas)	9.86E-01	9.86E-01	7.78E-02	7.13E-01	6.49E+00	1.09E+01	9.06E-05
# 2 (Fuel Oil)	1.36E-01	6.78E-02	2.92E+00	8.22E-03	8.22E-01	2.05E-01	2.49E-06
# 2 Maximum	***1.12E+00***	***1.05E+00***	***2.99E+00***	***7.22E-01***	***7.31E+00***	***1.11E+01***	***9.30E-05***
# 3 (Nat. Gas)	4.01E-01	4.01E-01	3.16E-02	2.90E-01	2.64E+00	4.43E+00	3.68E-05
# 3 (Fuel Oil)	5.51E-02	2.75E-02	1.19E+00	3.34E-03	3.34E-01	8.35E-02	1.01E-06
# 3 Maximum	***4.56E-01***	***4.26E-01***	***1.22E+00***	***2.93E-01***	***2.97E+00***	***4.51E+00***	***3.78E-05***
# 5 (Nat. Gas)	1.56E-01	1.56E-01	1.24E-02	1.13E-01	1.03E+00	1.73E+00	1.44E-05
# 5 (Fuel Oil)	2.15E-02	1.08E-02	4.63E-01	1.30E-03	1.30E-01	3.26E-02	3.95E-07
# 5 Maximum	***1.78E-01***	***1.67E-01***	***4.75E-01***	***1.15E-01***	***1.16E+00***	***1.76E+00***	***1.48E-05***
MOB VI #1**	5.87E-02	5.87E-02	4.64E-03	4.25E-02	3.86E-01	6.49E-01	5.40E-06
MOB VI #2**	5.87E-02	5.87E-02	4.64E-03	4.25E-02	3.86E-01	6.49E-01	5.40E-06
MOB VI #3**	1.63E-02	1.63E-02	1.29E-03	1.18E-02	1.07E-01	1.80E-01	1.50E-06
MOB TOTAL	***1.34E-01***	***1.34E-01***	***1.06E-02***	***9.68E-02***	***8.80E-01***	***1.48E+00***	***1.23E-05***
GRAND TOTAL[2]	**3.01E+00**	**2.84E+00**	**7.69E+00**	**1.95E+00**	**1.96E+01**	**3.00E+01**	**2.51E-04**

Potential Emissions from Boilers
Saint Alphonsus Medical Center

	Potential Annual Emissions							
Source ID	Benzene	Ethylbenzene	Formaldehyde	Napthalene	Hexane	Pentane	Toluene	o-Xylene
	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)	(ton/yr)
# 1 (Nat. Gas)	2.72E-04	0.00E+00	9.73E-03	0.00E+00	2.33E-01	3.37E-01	4.41E-04	0.00E+00
# 1 (Fuel Oil)	8.79E-06	2.61E-06	1.36E-03	4.64E-05	0.00E+00	0.00E+00	2.55E-04	4.48E-06
# 1 Maximum	***2.81E-04***	***2.61E-06***	***1.11E-02***	***4.64E-05***	***2.33E-01***	***3.37E-01***	***6.96E-04***	***4.48E-06***
# 2 (Nat. Gas)	2.72E-04	0.00E+00	9.73E-03	0.00E+00	2.33E-01	3.37E-01	4.41E-04	0.00E+00
# 2 (Fuel Oil)	8.79E-06	2.61E-06	1.36E-03	4.64E-05	0.00E+00	0.00E+00	2.55E-04	4.48E-06
# 2 Maximum	***2.81E-04***	***2.61E-06***	***1.11E-02***	***4.64E-05***	***2.33E-01***	***3.37E-01***	***6.96E-04***	***4.48E-06***
# 3 (Nat. Gas)	1.11E-04	0.00E+00	3.95E-03	0.00E+00	9.49E-02	1.37E-01	1.79E-04	0.00E+00
# 3 (Fuel Oil)	3.57E-06	1.06E-06	5.51E-04	1.89E-05	0.00E+00	0.00E+00	1.04E-04	1.82E-06
# 3 Maximum	***1.14E-04***	***1.06E-06***	***4.50E-03***	***1.89E-05***	***9.49E-02***	***1.37E-01***	***2.83E-04***	***1.82E-06***
# 5 (Nat. Gas)	4.32E-05	0.00E+00	1.54E-03	0.00E+00	3.71E-02	5.35E-02	7.00E-05	0.00E+00
# 5 (Fuel Oil)	1.40E-06	4.15E-07	2.15E-04	7.37E-06	0.00E+00	0.00E+00	4.04E-05	7.11E-07
# 5 Maximum	***4.46E-05***	***4.15E-07***	***1.76E-03***	***7.37E-06***	***3.71E-02***	***5.35E-02***	***1.10E-04***	***7.11E-07***
MOB VI #1**	1.62E-05	0.00E+00	5.80E-04	0.00E+00	1.39E-02	2.01E-02	2.63E-05	0.00E+00
MOB VI #2**	1.62E-05	0.00E+00	5.80E-04	0.00E+00	1.39E-02	2.01E-02	2.63E-05	0.00E+00
MOB VI #3**	4.51E-06	0.00E+00	1.61E-04	0.00E+00	3.86E-03	5.58E-03	7.30E-06	0.00E+00
MOB TOTAL	***3.70E-05***	***0.00E+00***	***1.32E-03***	***0.00E+00***	***3.17E-02***	***4.58E-02***	***5.99E-05***	***0.00E+00***
GRAND TOTAL[2]	**7.58E-04**	**6.70E-06**	**2.98E-02**	**1.19E-04**	**6.31E-01**	**9.11E-01**	**1.84E-03**	**1.15E-05**

Potential Emissions from Boilers
Saint Alphonsus Medical Center

Source ID	Potential Annual Emissions												
	Arsenic (ton/yr)	Beryllium (ton/yr)	Cadmium (ton/yr)	Chromium (ton/yr)	Cobalt (ton/yr)	Copper (ton/yr)	Lead (ton/yr)	Manganese (ton/yr)	Mercury (ton/yr)	Nickel (ton/yr)	Selenium (ton/yr)	Vanadium (ton/yr)	Zinc (ton/yr)
# 1 (Nat. Gas)	2.59E-05	1.56E-06	1.43E-04	1.82E-04	1.09E-05	1.10E-04	0.00E+00	4.93E-05	3.11E-05	2.72E-04	3.11E-06	2.98E-04	3.76E-03
# 1 (Fuel Oil)	2.27E-05	1.70E-05	1.70E-05	1.70E-05	0.00E+00	3.40E-05	5.10E-05	3.40E-05	1.70E-05	1.70E-05	8.51E-05	0.00E+00	2.27E-05
# 1 Maximum	***4.86E-05***	***1.86E-05***	***1.60E-04***	***1.99E-04***	***1.09E-05***	***1.44E-04***	***5.10E-05***	***8.33E-05***	***4.81E-05***	***2.89E-04***	***8.82E-05***	***2.98E-04***	***3.78E-03***
# 2 (Nat. Gas)	2.59E-05	1.56E-06	1.43E-04	1.82E-04	1.09E-05	1.10E-04	0.00E+00	4.93E-05	3.11E-05	2.72E-04	3.11E-06	2.98E-04	3.76E-03
# 2 (Fuel Oil)	2.27E-05	1.70E-05	1.70E-05	1.70E-05	0.00E+00	3.40E-05	5.10E-05	3.40E-05	1.70E-05	1.70E-05	8.51E-05	0.00E+00	2.27E-05
# 2 Maximum	***4.86E-05***	***1.86E-05***	***1.60E-04***	***1.99E-04***	***1.09E-05***	***1.44E-04***	***5.10E-05***	***8.33E-05***	***4.81E-05***	***2.89E-04***	***8.82E-05***	***2.98E-04***	***3.78E-03***
# 3 (Nat. Gas)	1.05E-05	6.32E-07	5.80E-05	7.38E-05	4.43E-06	4.48E-05	0.00E+00	2.00E-05	1.26E-05	1.11E-04	1.26E-06	1.21E-04	1.53E-03
# 3 (Fuel Oil)	9.22E-06	6.91E-06	6.91E-06	6.91E-06	0.00E+00	1.38E-05	2.07E-05	1.38E-05	6.91E-06	6.91E-06	3.46E-05	0.00E+00	9.22E-06
# 3 Maximum	***1.98E-05***	***7.54E-06***	***6.49E-05***	***8.07E-05***	***4.43E-06***	***5.86E-05***	***2.07E-05***	***3.39E-05***	***1.96E-05***	***1.18E-04***	***3.58E-05***	***1.21E-04***	***1.54E-03***
# 5 (Nat. Gas)	4.12E-06	2.47E-07	2.28E-05	2.88E-05	1.73E-06	1.75E-05	0.00E+00	7.82E-06	4.94E-06	4.32E-05	4.94E-07	4.74E-05	5.97E-04
# 5 (Fuel Oil)	3.60E-06	2.70E-06	2.70E-06	2.70E-06	0.00E+00	5.40E-06	8.10E-06	5.40E-06	2.70E-06	2.70E-06	1.35E-05	0.00E+00	3.60E-06
# 5 Maximum	***7.72E-06***	***2.95E-06***	***2.53E-05***	***3.15E-05***	***1.73E-06***	***2.29E-05***	***8.10E-06***	***1.32E-05***	***7.64E-06***	***4.59E-05***	***1.40E-05***	***4.74E-05***	***6.01E-04***
MOB VI #1**	1.55E-06	9.28E-08	8.50E-06	1.08E-05	6.49E-07	6.57E-06	0.00E+00	2.94E-06	1.86E-06	1.62E-05	1.86E-07	1.78E-05	2.24E-04
MOB VI #2**	1.55E-06	9.28E-08	8.50E-06	1.08E-05	6.49E-07	6.57E-06	0.00E+00	2.94E-06	1.86E-06	1.62E-05	1.86E-07	1.78E-05	2.24E-04
MOB VI #3**	4.29E-07	2.58E-08	2.36E-06	3.01E-06	1.80E-07	1.83E-06	0.00E+00	8.16E-07	5.15E-07	4.51E-06	5.15E-08	4.94E-06	6.23E-05
MOB TOTAL	***3.52E-06***	***2.11E-07***	***1.94E-05***	***2.46E-05***	***1.48E-06***	***1.50E-05***	***0.00E+00***	***6.69E-06***	***4.23E-06***	***3.70E-05***	***4.23E-07***	***4.05E-05***	***5.11E-04***
GRAND TOTAL[2]	**1.28E-04**	**4.76E-05**	**4.29E-04**	**5.34E-04**	**2.94E-05**	**3.85E-04**	**1.31E-04**	**2.20E-04**	**1.28E-04**	**7.79E-04**	**2.27E-04**	**8.06E-04**	**1.02E-02**

APPENDIX B

REPORT ON DISPERSION MODELING ANALYSIS

1. SUMMARY:

The Saint Alphonsus Regional Medical Center (SARMC) located in Boise, Idaho submitted a request to revise their Tier II operating permit to 1) permit increase the operating hours for burning oil in their boilers and 2) add four new emergency generators and three small boilers. Environmental Quality Management, Inc. (EQ) conducted a dispersion modeling analysis to assess the ambient air quality impact of new sources and modifications to existing sources at the SARMC facility This modeling included all current conditions and emissions for all sources that are operating that affect the level of emissions. The ambient air quality impact requirements under Tier II modeling in the draft State of Idaho *Air Quality Modeling Guideline* (May 2002) were followed as well as verbal guidance from DEQ. This EQ modeling included an evaluation of air impacts on the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants except ozone, which cannot be modeled for individual source impacts. The modeling also included an evaluation of nine toxic air pollutants. The ISCST3 Model with the enhanced PRIME algorithms for considering building downwash was used for all analyses along with five years of meteorological data from Boise. Considering the combined impacts of all sources at SARMC along with background concentrations, concentrations for all averaging periods were estimated to be less than the applicable NAAQS and acceptable ambient concentrations for criteria and toxic pollutants, respectively.

2. EQ MODELING:

2.1 Project and Analysis Overview

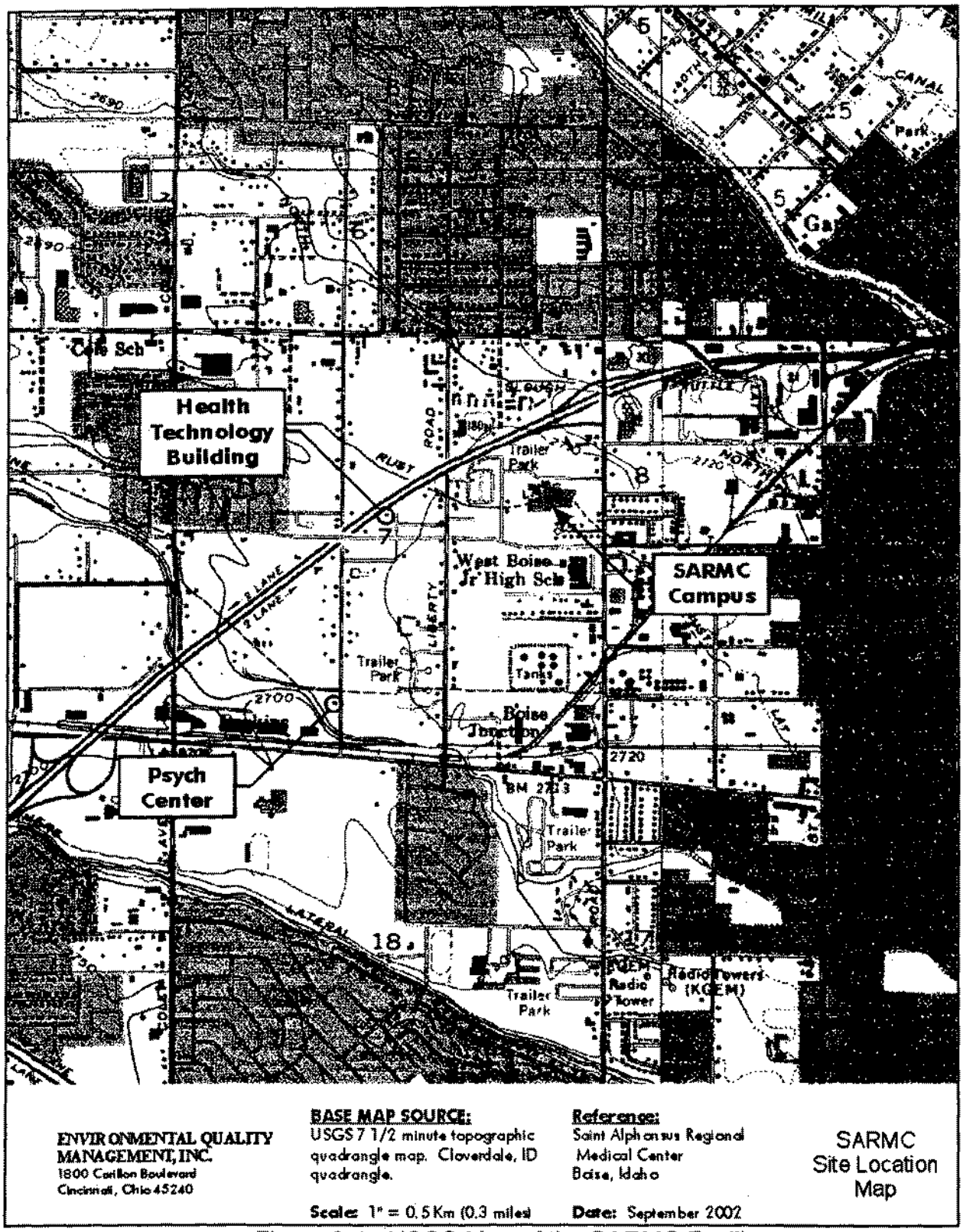
The SARMC facility is located in Northern Ada County, approximately 2 miles west of downtown Boise, which is designated an attainment or unclassifiable area for CO, SO_2, NO_x, and ozone. The area is not designated for PM_{10} but is assumed to be currently attaining the PM_{10} NAAQS. Figure 2-1 shows the SARMC facility and the surrounding area. The Health Technology Building and Psych Center are both SARMC-owned buildings but are located away from the main SARMC campus, as shown in Figure 2-1. Under the State of Idaho regulatory requirements, the facility must also demonstrate that the total ambient impacts from all sources for criteria pollutants are below the National Ambient Air Quality Standards (NAAQS). The applicable NAAQS for this analysis are listed in Table 2-1.

An initial list of 24 air toxic pollutants (TAPs) from SARMC was evaluated by EQ to determine which pollutants to include in the modeling. A conservative approach was initially used that went beyond Idaho's current policy of focusing TAP analyses only on new or modified sources at a facility. The pollutants were selected by first summing the maximum hourly emissions of each pollutant for each source to obtain a facility-wide maximum hourly emission rate. The facility-wide emission rate for each toxic was then compared to its respective screening emissions level (EL) found in IDAPA 58.01.01.585-586. Any toxic with facility-wide maximum hourly emissions that was greater than its EL was modeled. Table 2-2 shows the pollutant screening process. A total of 9 of the initial 24 toxics exceeded the EL and all are classified as carcinogens. The AACCs for all air toxics included in the modeling are listed in Table 2-3.

TABLE 2-1. APPLICABLE REGULATORY AIR QUALITY LIMITS FOR CRITERIA POLLUTANTS

POLLUTANT	Averaging Period	NAAQS, $\mu g/m^3$[a,b]
PM_{10}	Annual	50
	24-hour	150
CO	8-hour	10,000
	1-hour	40,000
SO_2	Annual	80
	24-hour	365
	3-hour	1,300
NO_x	Annual	100
Lead	Monthly	1.5

[a]Micrograms per cubic meter
[b]IDAPA 58.01.01.577 for criteria pollutants



ENVIRONMENTAL QUALITY MANAGEMENT, INC.
1800 Carillon Boulevard
Cincinnati, Ohio 45240

BASE MAP SOURCE:
USGS 7 1/2 minute topographic quadrangle map. Cloverdale, ID quadrangle.

Reference:
Saint Alphonsus Regional Medical Center
Boise, Idaho

Scale: 1" = 0.5 Km (0.3 miles)

Date: September 2002

SARMC
Site Location
Map

Figure 2-1. USGS Map of the SARMC Facility

Table 2-2. Summary of Pollutant Screening Process

BOILERS	Fuel Type	Operating Hours (hr/yr)	Rated Capacity (MMBtu/hr)	(MMscf/hr)	Fuel Rate (1000 gal/hr)	Potential Hourly Emissions (lb/hr)				
						PM_{10}	SO2	NOx	CO	Lead
Boiler #1	Nat. Gas	8400	31.50	3.09E-02		2.35E-01	1.85E-02	1.54E+00	2.59E+00	0
	Fuel Oil	360			2.28E-01	3.77E-01	1.62E+01	4.57E+00	1.14E+00	2.84E-04
#1 Max. Hourly Emissions						3.77E-01	1.62E+01	4.57E+00	2.59E+00	2.84E-04
Boiler #2	Nat. Gas	8400	31.50	3.09E-02		2.35E-01	1.85E-02	1.54E+00	2.59E+00	0
	Fuel Oil	360			2.28E-01	3.77E-01	1.62E+01	4.57E+00	1.14E+00	2.84E-04
#2 Max. Hourly Emissions						3.77E-01	1.62E+01	4.57E+00	2.59E+00	2.84E-04
Boiler #3	Nat. Gas	8400	12.80	1.25E-02		9.54E-02	7.53E-03	6.27E-01	1.05E+00	0
	Fuel Oil	360			9.28E-02	1.53E-01	6.59E+00	1.86E+00	4.64E-01	1.15E-04
#3 Max. Hourly Emissions						1.53E-01	6.59E+00	1.86E+00	1.05E+00	1.15E-04
Boiler #5	Nat. Gas	8400	5.00	4.90E-03		3.73E-02	2.94E-03	2.45E-01	4.12E-01	0
	Fuel Oil	360			3.62E-02	5.98E-02	2.57E+00	7.25E-01	1.81E-01	4.50E-05
#5 Max. Hourly Emissions						5.98E-02	2.57E+00	7.25E-01	4.12E-01	4.50E-05
MOBVI Boiler #1	Nat. Gas	8760	1.80	1.76E-03	NA	1.34E-02	1.06E-03	8.82E-02	1.48E-01	0
MOBVI Boiler #2	Nat. Gas	8760	1.80	1.76E-03	NA	1.34E-02	1.06E-03	8.82E-02	1.48E-01	0
MOBVI Boiler #3	Nat. Gas	8760	0.50	4.90E-04	NA	3.73E-03	2.94E-04	2.45E-02	4.12E-02	0

EMERGENCY GENERATORS	Fuel Type	Operating Hours (hr/yr)	Rated Capacity (kw)	(hp)	Fuel Rate (1000 gal/hr)	Potential Hourly Emissions (lb/hr)				
						PM_{10}	SO2	NOx	CO	Lead
Emergency Generator #1	Fuel Oil	125	675	904.5	NA	1.99E+00	1.85E+00	2.80E+01	6.04E+00	0
Emergency Generator #2	Fuel Oil	125	750	1005	NA	2.21E+00	2.06E+00	3.12E+01	6.71E+00	0
Emergency Generator #3	Fuel Oil	125	300	402	NA	8.84E-01	8.24E-01	1.25E+01	2.69E+00	0
Emergency Generator #4	Fuel Oil	125	750	1005	NA	2.21E+00	2.06E+00	3.12E+01	6.71E+00	0
Emergency Generator #5	Fuel Oil	125	80	107.2	NA	2.36E-01	2.20E-01	3.32E+00	7.16E-01	0
Emergency Generator #6	Fuel Oil	125	600	804	NA	1.77E+00	1.65E+00	2.49E+01	5.37E+00	0
Emergency Generator #7	Fuel Oil	125	200	268	NA	5.90E-01	5.49E-01	8.31E+00	1.79E+00	0
Emergency Generator #8	Fuel Oil	125	600	804	NA	1.77E+00	1.65E+00	2.49E+01	5.37E+00	0
Emergency Generator #9	Fuel Oil	125	30	40.2	NA	8.84E-02	8.24E-02	1.25E+00	2.69E-01	0

TOTAL FACILITY EMISSIONS (lb/hr)	1.27E+01	5.25E+01	1.77E+02	4.27E+01	7.27E-04
SCREENING EMISSIONS LEVEL (lb/hr)	NA	NA	NA	NA	NA
INCLUDED IN MODELING ANALYSIS?	YES	YES	YES	YES	YES

Table 2-2 (Continued). Summary of Pollutant Screening Process

BOILERS	Fuel Type	Operating Hours (hr/yr)	Rated Capacity (MMBtu/hr)	(MMscf/hr)	Fuel Rate (1000 gal/hr)	Potential Hourly Emissions (lb/hr)											
						1,3-Butadiene	Acetaldehyde	Acrolein	Benzene	Ethylbenzene	Formaldehyde	Napthalene	Hexane	Pentane	Propylene	Toluene	Xylene
Boiler #1	Nat. Gas	8400	31.50	3.09E-02		0	0	0	6.49E-05	0	2.32E-03	0	5.56E-02	8.03E-02	0	1.05E-04	0
	Fuel Oil	360			2.28E-01	0	0	0	4.86E-05	1.45E-05	7.53E-03	2.58E-04	0	0	0	1.42E-03	2.49E-05
#1 Max. Hourly Emissions						0	0	0	6.49E-05	1.45E-05	7.53E-03	2.58E-04	5.56E-02	8.03E-02	0	1.42E-03	2.49E-05
Boiler #2	Nat. Gas	8400	31.50	3.09E-02		0	0	0	6.49E-05	0	2.32E-03	0	5.56E-02	8.03E-02	0	1.05E-04	0
	Fuel Oil	360			2.28E-01	0	0	0	4.86E-05	1.45E-05	7.53E-03	2.58E-04	0	0	0	1.42E-03	2.49E-05
#2 Max. Hourly Emissions						0	0	0	6.49E-05	1.45E-05	7.53E-03	2.58E-04	5.56E-02	8.03E-02	0	1.42E-03	2.49E-05
Boiler #3	Nat. Gas	8400	12.60	1.25E-02		0	0	0	2.64E-05	0	9.41E-04	0	2.26E-02	3.26E-02	0	4.27E-05	0
	Fuel Oil	360			9.28E-02	0	0	0	1.98E-05	5.90E-06	3.06E-03	1.05E-04	0	0	0	5.75E-04	1.01E-05
#3 Max. Hourly Emissions						0	0	0	2.64E-05	5.90E-06	3.06E-03	1.05E-04	2.26E-02	3.26E-02	0	5.75E-04	1.01E-05
Boiler #5	Nat. Gas	8400	5.00	4.90E-03		0	0	0	1.03E-05	0	3.68E-04	0	8.82E-03	1.27E-02	0	1.67E-05	0
	Fuel Oil	360			3.62E-02	0	0	0	7.75E-06	2.30E-06	1.20E-03	4.09E-05	0	0	0	2.25E-04	3.95E-06
#5 Max. Hourly Emissions						0	0	0	1.03E-05	2.30E-06	1.20E-03	4.09E-05	8.82E-03	1.27E-02	0	2.25E-04	3.95E-06
MOBVI Boiler #1	Nat. Gas	8760	1.80	1.76E-03	NA	0	0	0	3.71E-06	0	1.32E-04	0	3.18E-03	4.59E-03	0	6.00E-06	0
MOBVI Boiler #2	Nat. Gas	8760	1.80	1.76E-03	NA	0	0	0	3.71E-06	0	1.32E-04	0	3.18E-03	4.59E-03	0	6.00E-06	0
MOBVI Boiler #3	Nat. Gas	8760	0.50	4.90E-04	NA	0	0	0	1.03E-06	0	3.68E-05	0	8.82E-04	1.27E-03	0	1.67E-06	0
EMERGENCY GENERATORS	Fuel Type	Operating Hours (hr/yr)	Rated Capacity (kw)	(hp)	Fuel Rate (1000 gal/hr)	Potential Hourly Emissions (lb/hr)											
						1,3-Butadiene	Acetaldehyde	Acrolein	Benzene	Ethylbenzene	Formaldehyde	Napthalene	Hexane	Pentane	Propylene	Toluene	Xylene
Emergency Generator #1	Fuel Oil	125	675	904.5	NA	2.48E-04	4.86E-03	5.86E-04	5.91E-03	0	7.47E-03	0	0	0	1.63E-02	2.59E-03	1.80E-03
Emergency Generator #2	Fuel Oil	125	750	1005	NA	2.75E-04	5.40E-03	6.51E-04	6.56E-03	0	8.30E-03	0	0	0	1.82E-02	2.88E-03	2.00E-03
Emergency Generator #3	Fuel Oil	125	300	402	NA	1.10E-04	2.16E-03	2.60E-04	2.63E-03	0	3.32E-03	0	0	0	7.26E-03	1.15E-03	8.02E-04
Emergency Generator #4	Fuel Oil	125	750	1005	NA	2.75E-04	5.40E-03	6.51E-04	6.56E-03	0	8.30E-03	0	0	0	1.82E-02	2.88E-03	2.00E-03
Emergency Generator #5	Fuel Oil	125	80	107.2	NA	2.93E-05	5.76E-04	6.94E-05	7.00E-04	0	8.85E-04	0	0	0	1.94E-03	3.07E-04	2.14E-04
Emergency Generator #6	Fuel Oil	125	600	804	NA	2.20E-04	4.32E-03	5.21E-04	5.25E-03	0	6.64E-03	0	0	0	1.45E-02	2.30E-03	1.60E-03
Emergency Generator #7	Fuel Oil	125	200	268	NA	7.34E-05	1.44E-03	1.74E-04	1.75E-03	0	2.21E-03	0	0	0	4.84E-03	7.67E-04	5.35E-04
Emergency Generator #8	Fuel Oil	125	600	804	NA	2.20E-04	4.32E-03	5.21E-04	5.25E-03	0	6.64E-03	0	0	0	1.45E-02	2.30E-03	1.60E-03
Emergency Generator #9	Fuel Oil	125	30	40.2	NA	1.10E-05	2.16E-04	2.60E-05	2.63E-04	0	3.32E-04	0	0	0	7.26E-04	1.15E-04	8.02E-05
TOTAL FACILITY EMISSIONS (lb/hr)						1.46E-03	2.87E-02	3.46E-03	3.50E-02	3.72E-05	6.37E-02	6.82E-04	1.50E-01	2.16E-01	9.64E-02	1.89E-02	1.07E-02
SCREENING EMISSIONS LEVEL (lb/hr)						2.40E-05	3.00E-03	1.70E-02	8.00E-04	2.90E+01	5.10E-04	3.33E+00	1.20E+01	1.18E+02	NA	2.50E+01	2.90E+01
INCLUDED IN MODELING ANALYSIS?						YES	YES	NO	YES	NO	YES	NO	NO	NO	NO	NO	NO

Table 2-2 (Continued). Summary of Pollutant Screening Process

BOILERS	Fuel Type	Operating Hours (hr/yr)	Rated Capacity (MMBtu/hr)	(MMscf/hr)	Fuel Rate (1000 gal/hr)	Potential Hourly Emissions (lb/hr)											
						Arsenic	Beryllium	Cadmium	Chromium	Cobalt	Copper	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
Boiler #1	Nat. Gas	8400	31.50	3.09E-02		6.18E-06	3.71E-07	3.40E-05	4.32E-05	2.59E-06	2.63E-05	1.17E-05	7.41E-06	6.49E-05	7.41E-07	7.10E-05	8.96E-04
	Fuel Oil	360			2.28E-01	1.26E-04	9.45E-05	9.45E-05	9.45E-05	0	1.89E-04	1.89E-04	9.45E-05	9.45E-05	4.73E-04	0	1.26E-04
#1 Max. Hourly Emissions						1.26E-04	9.45E-05	9.45E-05	9.45E-05	2.59E-06	1.89E-04	1.89E-04	9.45E-05	9.45E-05	4.73E-04	7.10E-05	8.96E-04
Boiler #2	Nat. Gas	8400	31.50	3.09E-02		6.18E-06	3.71E-07	3.40E-05	4.32E-05	2.59E-06	2.63E-05	1.17E-05	7.41E-06	6.49E-05	7.41E-07	7.10E-05	8.96E-04
	Fuel Oil	360			2.28E-01	1.26E-04	9.45E-05	9.45E-05	9.45E-05	0	1.89E-04	1.89E-04	9.45E-05	9.45E-05	4.73E-04	0	1.26E-04
#2 Max. Hourly Emissions						1.26E-04	9.45E-05	9.45E-05	9.45E-05	2.59E-06	1.89E-04	1.89E-04	9.45E-05	9.45E-05	4.73E-04	7.10E-05	8.96E-04
Boiler #3	Nat. Gas	8400	12.80	1.25E-02		2.51E-06	1.51E-07	1.38E-05	1.76E-05	1.05E-06	1.07E-05	4.77E-06	3.01E-06	2.64E-05	3.01E-07	2.89E-05	3.64E-04
	Fuel Oil	360			9.26E-02	5.12E-05	3.84E-05	3.84E-05	3.84E-05	0	7.68E-05	7.68E-05	3.84E-05	3.84E-05	1.92E-04	0	5.12E-05
#3 Max. Hourly Emissions						5.12E-05	3.84E-05	3.84E-05	3.84E-05	1.05E-06	7.68E-05	7.68E-05	3.84E-05	3.84E-05	1.92E-04	2.89E-05	3.64E-04
Boiler #5	Nat. Gas	8400	5.00	4.90E-03		9.80E-07	5.88E-08	5.39E-06	6.86E-06	4.12E-07	4.17E-06	1.86E-06	1.18E-06	1.03E-05	1.18E-07	1.13E-05	1.42E-04
	Fuel Oil	360			3.62E-02	2.00E-05	1.50E-05	1.50E-05	1.50E-05	0	3.00E-05	3.00E-05	1.50E-05	1.50E-05	7.50E-05	0	2.00E-05
#5 Max. Hourly Emissions						2.00E-05	1.50E-05	1.50E-05	1.50E-05	4.12E-07	3.00E-05	3.00E-05	1.50E-05	1.50E-05	7.50E-05	1.13E-05	1.42E-04
MOBVI Boiler #1	Nat. Gas	8760	1.80	1.76E-03	NA	3.53E-07	2.12E-08	1.94E-06	2.47E-06	1.48E-07	1.50E-06	6.71E-07	4.24E-07	3.71E-06	4.24E-08	4.06E-06	5.12E-05
MOBVI Boiler #2	Nat. Gas	8760	1.80	1.76E-03	NA	3.53E-07	2.12E-08	1.94E-06	2.47E-06	1.48E-07	1.50E-06	6.71E-07	4.24E-07	3.71E-06	4.24E-08	4.06E-06	5.12E-05
MOBVI Boiler #3	Nat. Gas	8760	0.50	4.90E-04	NA	9.80E-08	5.88E-09	5.39E-07	6.86E-07	4.12E-08	4.17E-07	1.86E-07	1.18E-07	1.03E-06	1.18E-08	1.13E-06	1.42E-05

EMERGENCY GENERATORS	Fuel Type	Operating Hours (hr/yr)	Rated Capacity (kw)	(hp)	Fuel Rate (1000 gal/hr)	Potential Hourly Emissions (lb/hr)											
						Arsenic	Beryllium	Cadmium	Chromium	Cobalt	Copper	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
Emergency Generator #1	Fuel Oil	125	675	904.5	NA	0	0	0	0	0	0	0	0	0	0	0	0
Emergency Generator #2	Fuel Oil	125	750	1005	NA	0	0	0	0	0	0	0	0	0	0	0	0
Emergency Generator #3	Fuel Oil	125	300	402	NA	0	0	0	0	0	0	0	0	0	0	0	0
Emergency Generator #4	Fuel Oil	125	750	1005	NA	0	0	0	0	0	0	0	0	0	0	0	0
Emergency Generator #5	Fuel Oil	125	80	107.2	NA	0	0	0	0	0	0	0	0	0	0	0	0
Emergency Generator #6	Fuel Oil	125	600	804	NA	0	0	0	0	0	0	0	0	0	0	0	0
Emergency Generator #7	Fuel Oil	125	200	268	NA	0	0	0	0	0	0	0	0	0	0	0	0
Emergency Generator #8	Fuel Oil	125	600	804	NA	0	0	0	0	0	0	0	0	0	0	0	0
Emergency Generator #9	Fuel Oil	125	30	40.2	NA	0	0	0	0	0	0	0	0	0	0	0	0

TOTAL FACILITY EMISSIONS (lb/hr)	3.24E-04	2.42E-04	2.47E-04	2.48E-04	6.99E-06	4.88E-04	4.86E-04	2.43E-04	2.51E-04	1.21E-03	1.91E-04	2.41E-03
SCREENING EMISSIONS LEVEL (lb/hr)	1.50E-06	2.80E-05	3.70E-06	5.60E-07	3.30E-03	1.30E-02	6.70E-02	1.00E-03	2.70E-05	1.30E-02	3.00E-03	6.67E-01
INCLUDED IN MODELING ANALYSIS?	YES	YES	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO

TABLE 2-3. APPLICABLE REGULATORY AIR QUALITY LIMITS FOR TOXIC AIR POLLLUTANTS

POLLUTANT	Averaging Period	AACC[a], $\mu g/m^3$
1,3-Butadiene	Annual	0.0036
Acetaldehyde	Annual	0.45
Arsenic	Annual	0.00023
Benzene	Annual	0.12
Beryllium	Annual	0.0042
Cadmium	Annual	0.00056
Chromium[b]	Annual	0.000083
Formaldehyde	Annual	0.077
Nickel	Annual	0.0042

[a]Acceptable Ambient Concentrations for Carcinogens (AACC) were taken from IDAPA 58.01.01.586 for toxic air pollutants and are based on annual averages.
[b]Refers to Chromium VI.

The facility property is bisected by a number of roads and no obstructions restrict access to the site. Thus, selection of receptors around the facility considered all areas around facility-owned buildings or structures as ambient air. All large buildings and structures at the facility were considered in the modeling by using their exact locations and dimensions with regard to individual source emission release points.

The remainder of this section presents the modeling methodologies and results of the ambient air impact assessment performed by EQ for the proposed project. A summary of the models used in the analysis is as follows:

- Used the ISCPRIME Model (Industrial Source Complex Model, Version 3 in its short-term mode, which includes the PRIME building downwash algorithms - Version 99020 - using the BeeLine software called BEEST - Version 8.6) treating all terrain in the area in the model using 30-m Digital Elevation Model (DEM) data.

- Used the BPIP-PRIME (Building Profile Input Program) code for all downwash calculations (latest version is included in the BEEST for Windows98 BeeLine software).

- Included all modeling elements as applicable and discussed in the Idaho modeling guidance and the *Guideline on Air Quality Models*, EPA-450/2-78-027R, FR 41838, 12 August 1996.

2.2 Source Identification And Characterization

Sources modeled in this analysis were selected from a letter dated April 4, 2002 from CH2M Hill, on behalf of SARMC, to DEQ that contained information on emission sources, stack parameters, and operating specifications for emission units. Only point sources were identified and presented in the modeling documentation and emission calculations. Table 2-4 presents the sources used in this modeling including specific stack and flow characteristics. Emissions of each pollutant were specified on both a short-term (1-hour) basis as well as a long-term (annual emissions averaged over a whole year, i.e., 8760 hours). Appropriate emission rates were matched to averaging periods for each compliance level, e.g., NAAQS or AACC. Table 2-5 shows all pollutants that were modeled on a short-term basis and their emission rates. Table 2-6 shows all pollutants that were modeled on a long-term basis and their emission rates. Sources are identified in all tables in terms of source identifiers defined by EQ. Figure 2-2 shows source locations and building configurations at the SARMC campus. Figure 2-3 shows source locations and building configurations at the Health Technology Building and Psychological Center.

The emission rates used in the modeling represent current operating conditions based on changes to emission sources and the replacement or addition of emission units. The changes at the facility and their affect on each source include: replacement of Generator No.3 that results in a higher exit flow rate; movement of Generator No.5 from the Information Resources building to the Psychological Center; and addition of three new boilers to the cardiology building. These changes are reflected in Table 2-4. In addition, several stacks have a rain cap or a horizontal discharge as indicated for each source as appropriate in Table 2-4. Per DEQ guidance, the exit flow velocities and stack diameters of these sources were adjusted accordingly as shown to discount the effects of plume rise.

Although the applicant indicated that only one of the large boilers (e.g., Boiler 1) would be operated simultaneously with Boiler 5, the initial analysis included all boilers operating on oil simultaneously. As discussed below, this scenario did not exceed any NAAQS or AACC and it is not necessary to include a permit condition that limits the simultaneous operation of the boilers on oil.

TABLE 2-4. STACK PARAMETERS FOR SOURCES AT THE SARMC FACILITY

Stack ID	Source Description	UTM-East, m	UTM-North, m	Stack Height, m	Stack Temp., K	Stack Diameter, m	Flow Vel., m/s
B123_G12[a]	South Tower Colocated Stack	560046.3	4829006	28.95	502.59	1.75	5.16
BOILER1	South Tower Boiler (Colocated)	560046.3	4829006	28.95	502.59	1.75	3.16
BOILER2	South Tower Boiler (Colocated)	560046.3	4829006	28.95	502.59	1.75	3.16
BOILER3	South Tower Boiler (Colocated)	560046.3	4829006	28.95	502.59	1.75	0.64
GENERTR1	South Tower Emergency Generator (Colocated)	560046.3	4829006	28.95	760.93	1.75	1.64
GENERTR2	South Tower Emergency Generator (Colocated)	560046.3	4829006	28.95	750.37	1.75	1.38
BOILER5[b]	North Tower Boiler (Rain Cap)	560119.9	4829099	28.34	560.93	25.49	0.05
MOBVI1[b]	Cardiology Building Boiler (New Boiler; Rain Cap)	560082.1	4829176	8.22	433.15	16.97	0.05
MOBVI2[b]	Cardiology Building Boiler (New Boiler; Rain Cap))	560082.5	4829173	8.22	433.15	16.97	0.05
MOBVI3[b]	Cardiology Building Boiler (New Boiler; Rain Cap)	560079	4829172	8.22	433.15	8.93	0.05
GENERTR3	Information Resources Building Emergency Generator (Replacement Generator)	560176.5	4828957	3.35	702.59	0.15	78.65
GENERTR4[b]	North Tower Emergency Generator (Horizontal Discharge)	560160.6	4829096	28.34	713.71	62.26	0.05
GENERTR5	Psych Center Emergency Generator (Formerly at Information Resources Building)	559268	4828149	6.09	810.93	0.10	40.98
GENERTR6[b]	Orthopedic Building Emergency Generator (Horizontal Discharge)	559964.8	4829015	7.31	724.82	60.39	0.05
GENERTR7	Liberty Building Emergency Generator	559859.9	4829005	3.44	619.26	0.15	57.95
GENERTR8[b]	Cardiology Building Emergency Generator (Horizontal Discharge)	560092.2	4829159	3.10	697.04	55.36	0.05
GENERTR9	Health Tech Building Emergency Generator	559485.3	4828915	1.64	778.15	0.762	0.33

[a]Includes five separate emission units (BOILER1, BOILER2, BOILER3, GENERTR1, GENERTR2) all exiting from a common stack.
[b]Source with adjusted exit velocity and stack diameter due to rain cap or horizontal discharge.

TABLE 2-5. SHORT-TERM EMISSION RATES USED IN SARMC MODELING

Source ID	Source Description	PM_{10}, lb/hr	NO_x, lb/hr	SO_2, lb/hr	CO, lb/hr	Lead, lb/hr
B123_G12[a]	South Tower Colocated Stack	5.10	70.2	42.9	18.98	6.83E-04
BOILER5	North Tower Boiler	5.98E-02	0.725	2.57	0.412	4.5E-05
MOBVI1	Cardiology Building NG Boiler	1.34E-02	0.0882	1.06E-03	0.148	0
MOBVI2	Cardiology Building NG Boiler	1.34E-02	0.0882	1.06E-03	0.148	0
MOBVI3	Cardiology Building NG Boiler	3.73E-03	2.45E-02	2.94E-04	4.12E-02	0
GENERTR3	IT Building Emergency Generator	0.88	12.46	0.82	2.69	0
GENERTR4	North Tower Emergency Generator	2.21	31.16	2.06	6.71	0
GENERTR5	Psych Center Emergency Generator	0.24	3.32	0.22	0.72	0
GENERTR6	Orthopedic Building Emergency Generator	1.77	24.92	1.65	5.37	0
GENERTR7	Liberty Building Emergency Generator	0.59	8.31	0.55	1.79	0
GENERTR8	Cardiology Building Emergency Generator	1.77	24.92	1.65	5.37	0
GENERTR9	Health Tech Building Emergency Generator	0.09	1.25	0.08	0.27	0

[a]Includes five separate emission units (BOILER1, BOILER2, BOILER3, GENERTR1, GENERTR2) all exiting from a common stack.

TABLE 2-6. LONG-TERM EMISSION RATES USED IN SARMC MODELING

Source ID	Source Description	PM_{10}, lb/hr	NO_x, lb/hr	SO_2, lb/hr	Acetaldehyde, lb/hr	1,3-Butadiene, lb/hr	Benzene, lb/hr	Formaldehyde, lb/hr
B123_G12[a]	South Tower Colocated Stack	0.64	4.86	1.70	1.5E-04	7.5E-06	3.3E-04	6.3E-03
BOILER5	North Tower Boiler	3.8E-02	0.27	0.11	0	0	1.0E-05	4.0E-04
MOBVI1	Cardiology Building NG Boiler	1.3E-02	0.09	1.1E-03	0	0	3.7E-06	1.3E-04
MOBVI2	Cardiology Building NG Boiler	1.3E-02	0.09	1.1E-03	0	0	3.7E-06	1.3E-04
MOBVI3	Cardiology Building NG Boiler	3.7E-03	2.5E-02	2.9E-04	0	0	1.0E-06	3.7E-05
GENERTR3	IT Building Emergency Generator	1.3E-02	0.18	1.2E-02	3.1E-05	1.6E-06	3.7E-05	4.7E-05
GENERTR4	North Tower Emergency Generator	3.2E-02	0.44	2.9E-02	7.7E-05	3.9E-06	9.4E-05	1.2E-04
GENERTR5	Psych Center Emergency Generator	3.4E-03	4.7E-02	3.1E-03	8.2E-06	4.2E-07	1.0E-05	1.3E-05
GENERTR6	Orthopedic Building Emergency Generator	2.5E-02	0.36	2.4E-02	6.2E-05	3.1E-06	7.5E-05	9.5E-05
GENERTR7	Liberty Building Emergency Generator	8.4E-03	0.12	7.8E-03	2.1E-05	1.0E-06	2.5E-05	3.2E-05
GENERTR8	Cardiology Building Emergency Generator	2.5E-02	0.36	2.4E-02	6.2E-05	3.1E-06	7.5E-05	9.5E-05
GENERTR9	Health Tech Building Emergency Generator	1.3E-03	1.8E-02	1.2E-03	3.1E-06	1.6E-07	3.7E-06	4.7E-06

[a]Includes five separate emission units (BOILER1, BOILER2, BOILER3, GENERTR1, GENERTR2) all exiting from a common stack.

TABLE 2-6 (Continued). LONG-TERM EMISSION RATES USED IN SARMC MODELING

Source ID	Source Description	Arsenic, lb/hr	Beryllium, lb/hr	Cadmium, lb/hr	Nickel, lb/hr	Chromium, lb/hr
B123_G12[a]	South Tower Colocated Stack	2.7E-05	1.0E-05	8.8E-05	1.6E-04	1.6E-05
BOILER5	North Tower Boiler	1.8E-06	6.7E-07	5.8E-06	1.1E-05	1.1E-06
MOBVI1	Cardiology Building NG Boiler	3.5E-07	2.1E-08	1.9E-06	3.7E-06	3.7E-07
MOBVI2	Cardiology Building NG Boiler	3.5E-07	2.1E-08	1.9E-06	3.7E-06	3.7E-07
MOBVI3	Cardiology Building NG Boiler	9.8E-08	5.9E-09	5.4E-07	1.0E-06	1.0E-07
GENERTR3	IT Building Emergency Generator	0	0	0	0	0
GENERTR4	North Tower Emergency Generator	0	0	0	0	0
GENERTR5	Psych Center Emergency Generator	0	0	0	0	0
GENERTR6	Orthopedic Building Emergency Generator	0	0	0	0	0
GENERTR7	Liberty Building Emergency Generator	0	0	0	0	0
GENERTR8	Cardiology Building Emergency Generator	0	0	0	0	0
GENERTR9	Health Tech Building Emergency Generator	0	0	0	0	0

[a]Includes five separate emission units (BOILER1, BOILER2, BOILER3, GENERTR1, GENERTR2) all exiting from a common stack.

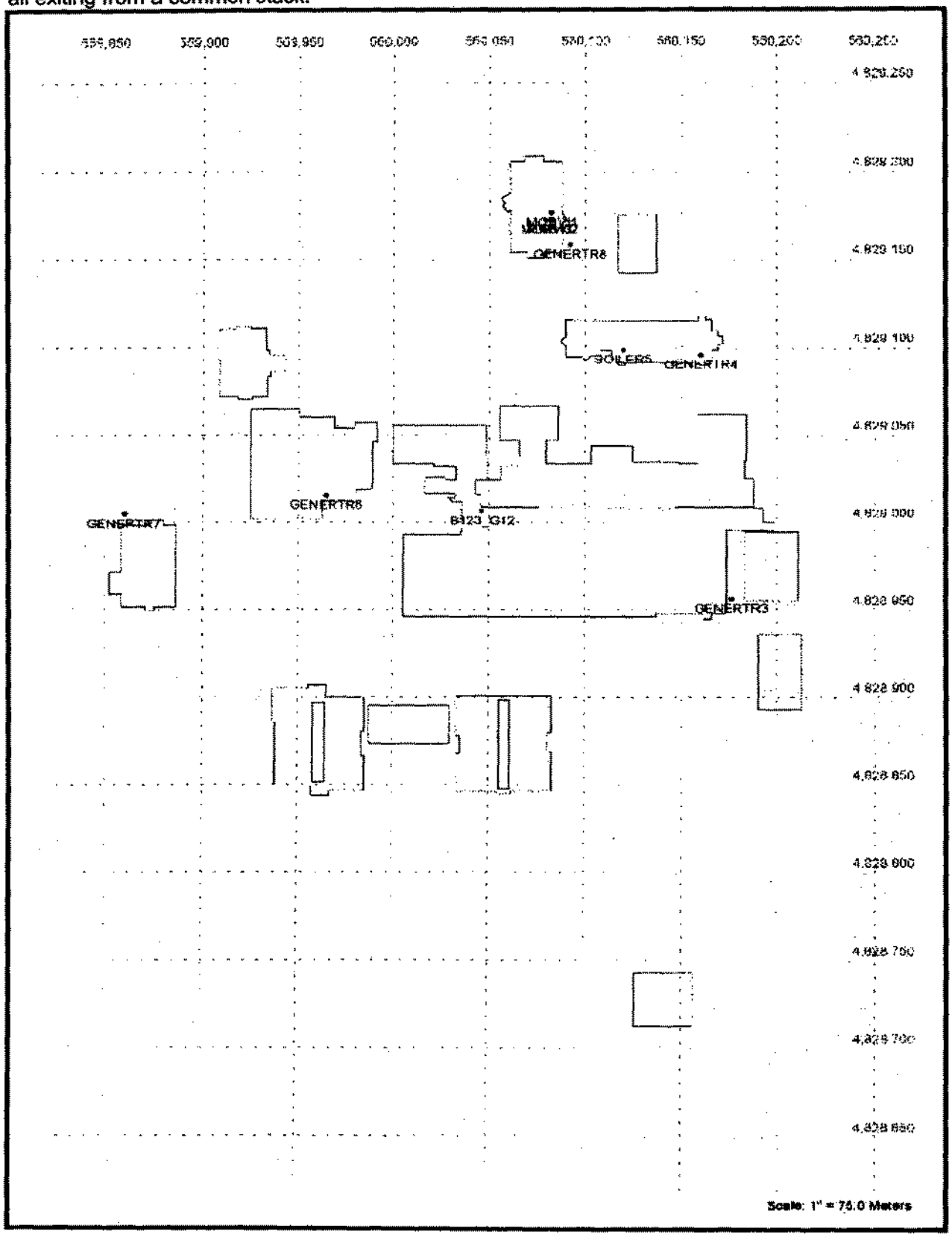
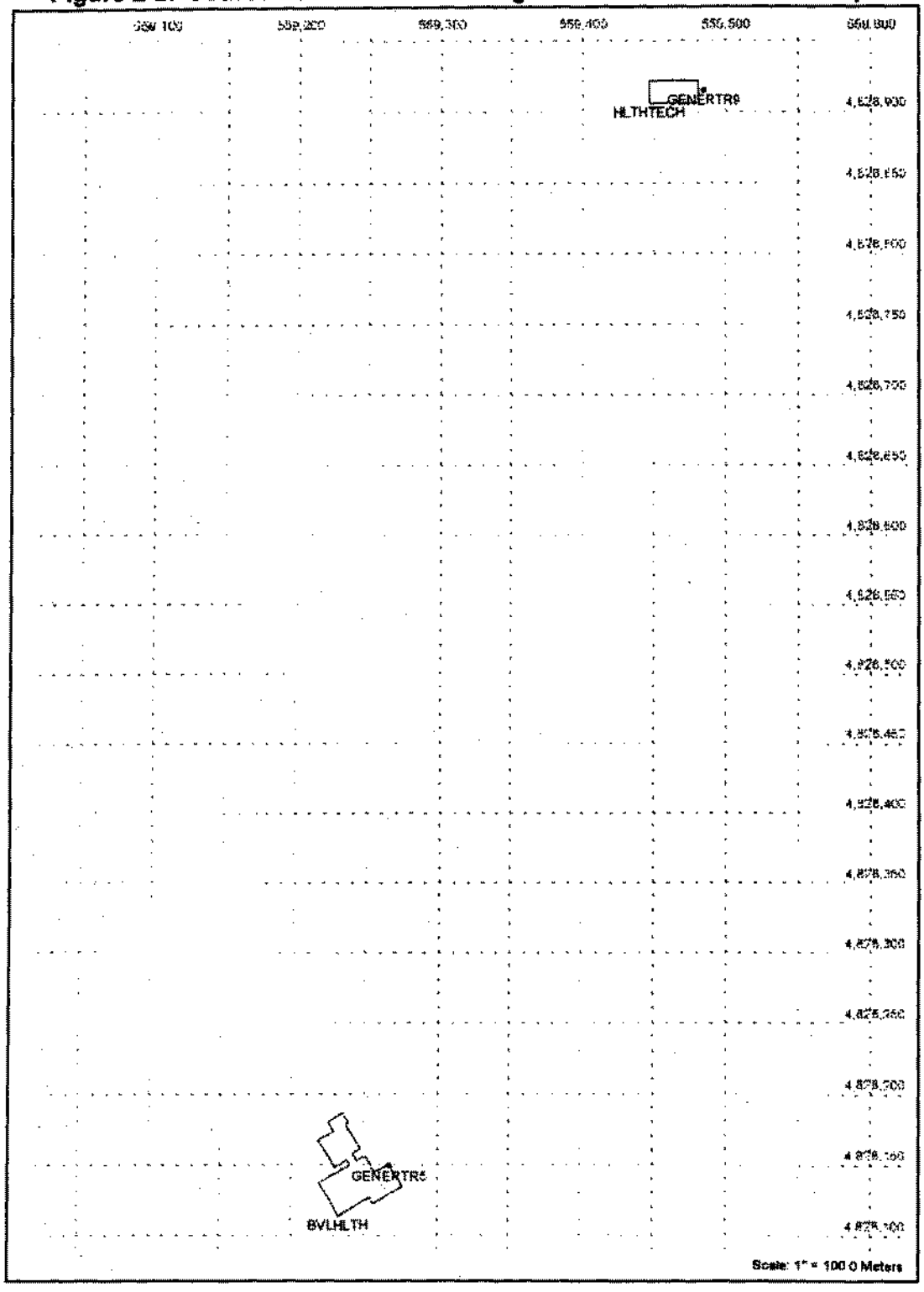


Figure 2-2. Source Locations and Configurations at the SARMC Campus



Health Technology Building and Psych Center

2.3 Air Quality Modeling Methodology

This section provides an overview of the modeling methodology that was used to model the Tier II air quality impacts for the SARMC Boise facility. Modeling was performed for all sources described in the previous section for each criteria and toxic air pollutant. All modeling selections, options, receptors, terrain elevation data, and output options are described below.

2.3.1 Model Selection

The Industrial Source Complex Model (ISC), including the Plume Rise Model Enhancements Model (PRIME), was used for this analysis. The ISCPRIME Model was used to best account for the building downwash effects that were expected to occur in the near wake regions. These near wake regions exist due to the proximity of the buildings and sources to nearby ambient air, specifically, on the nearby roadways passing through portions of the facility. The use of ISCPRIME was considered reasonable as the substitute for the "preferred" ISCST3 Model, which did not include as robust a treatment of the downwash. All regulatory default options were used in the modeling (most features and option selections in ISCPRIME are identical to ISCST3 Model, which is a "preferred" guideline model).

The Industrial Source Complex Model is a steady-state straight-line Gaussian plume model that is a "preferred" model recommended by EPA's *Guideline on Air Quality Models*. The ISCPRIME Model has many features that make it the most representative model for this analysis including:

- Preferred model status for the ISC portion of the model
- Multiple sources
- Point source capabilities
- Hour-by-hour meteorological data used in calculations
- User-specified grouped source concentration estimates
- Urban/rural classification
- Building downwash using the new PRIME algorithms
- Consideration of elevated terrain receptors
- Variable receptor locations

The ISCPRIME Model was implemented using the windows interface program by Bowman Environmental, Inc. (BEELINE) software (BEEST) in version 8.6. Digitized terrain data for the modeling was derived from the 30-m Digital Elevation Model (DEM) data for each applicable USGS 7.5-minute quadrangle map.

No other air dispersion models were used in this analysis. Another related model, however, was used for the calculation of building downwash influence on the plumes. This model was the U.S. EPA *Building Profile Input Program PRIME* (BPIP-PRIME) (draft user's guide, October 1993). The BPIP-PRIME Model is included in the BEEST, Version 8.6 software.

2.3.2 Receptor Locations

Receptor locations were chosen consistent with recommendations from the *Guideline on Air Quality Models* and the Idaho *Air Quality Modeling Guidance* to determine the maximum concentrations for SARMC. Receptors were located where ambient air exists, i.e., any location at or beyond property fence lines or controlled access areas. All areas owned by SARMC, except buildings or structures, were considered ambient air because they are not fenced or access controlled. The fence line receptors used for this analysis were placed along the boundaries of the buildings. These were spaced at about 20-meter intervals. Multiple Cartesian grids were arranged beyond the fence line out to 5,000 m. Maximum concentrations were expected to be well within that distance based on previous modeling performed in support of earlier permitting activities. Grid spacings consisted of 50-m spacing from the site out to 250 m, 100-m spacing out to 1000 m, 300-m spacing out to 2,400 m, and 500-m spacing out to 5,000 m.

Figure 2-4 shows a large-scale view of the facility and all receptors included in the ISCPRIME analysis. Figure 2-5 shows the same receptor grid at a closer scale with detail of the sources and other existing structures.

The elevation of each receptor above mean sea level was included in the analysis. These elevations were derived from the 30-m resolution Digital Elevation Model (DEM) outputs for all appropriate USGS 7.5-minute quadrangle maps for the area.

2.3.3 Meteorological Data

For the ISCPRIME Model, preprocessed meteorological data were required. Because several averaging periods for the various NAAQS are of concern, five years of representative data were used for this analysis. Data recommended by the DEQ were that for Boise. Both surface observations and mixing heights from the upper air soundings were available. As recommended, this data set consisted of representative surface meteorological observations from the Boise Airport (Station No. 24131). These data include hourly observations of wind speed, wind direction, opaque cloud cover, and temperature. Upper air data required were the twice-daily mixing heights associated with the surface data that were obtained from derived observations also taken at the Boise Airport. The period of record for the meteorological data was 1987 through 1991 and included data for every hour of each year.

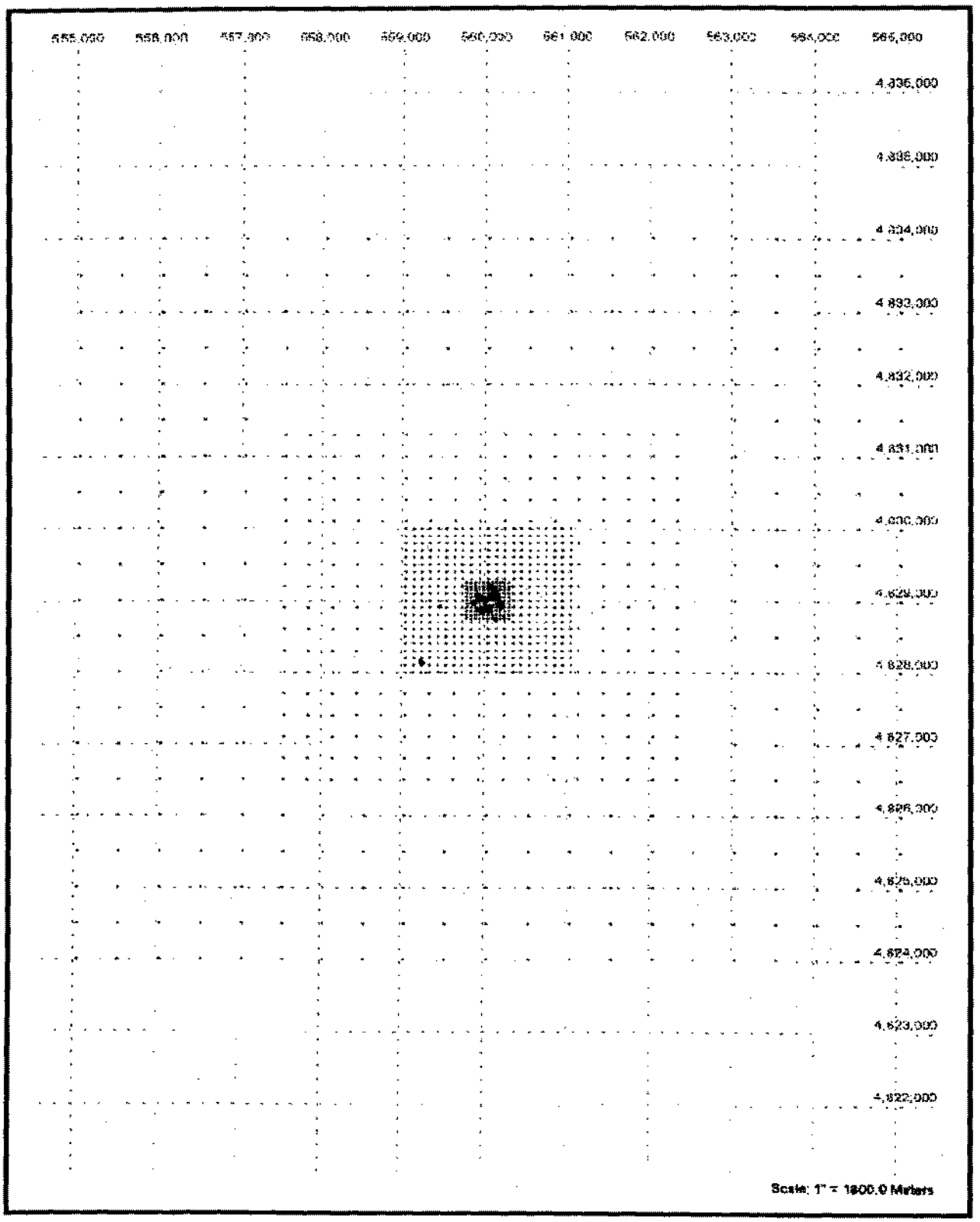


Figure 2-4. Overall Receptor Grid for the SARMC Boise Facility

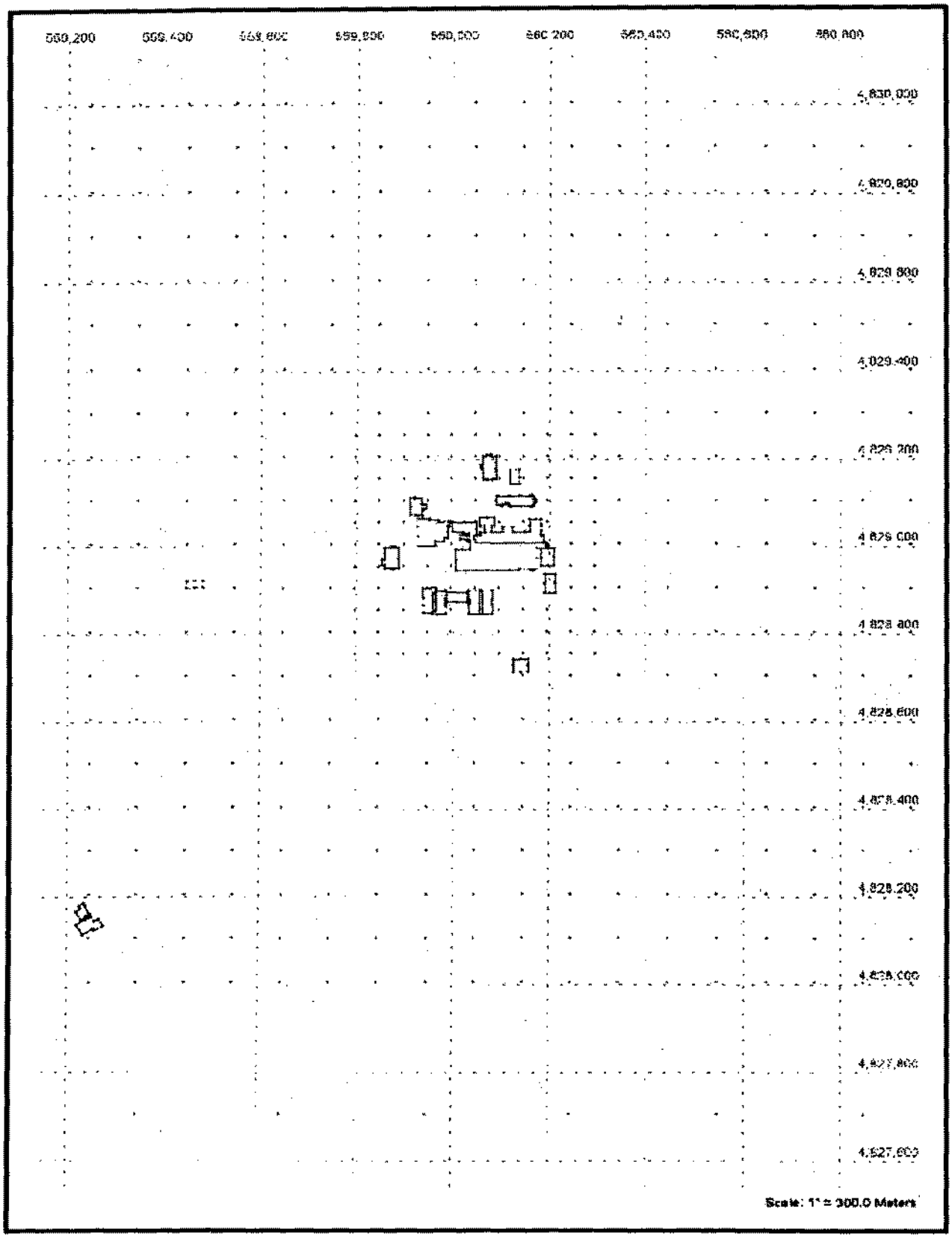


Figure 2-5. Central Portion of Receptor Grid for the SARMC Boise Facility

2.3.4 Urban/Rural Classification

The ISCPRIME Model has the option of considering either a rural or urban mode of operation that selects dispersion coefficients used in the model to calculate concentration profiles in the horizontal and vertical directions. The area within a 3.0-km radius of the site was identified by general land-use type on USGS topography maps. Based on EPA recommendations, to be classified "urban," greater than 50 percent of the land within 3.0 km of the source must be used by source types in the following categories:

- I1 - Heavy Industrial - major chemical, steel, and fabrication industries; generally 3- to 5-story buildings - grass and tree growth extremely rare; <5 percent vegetation.

- I2 - Light Industrial - rail yards, truck depots, warehouses, industrial parks, minor fabrications; generally 1- to 3-story buildings - very limited grass, trees almost totally absent; <5 percent vegetation; C-1 - Commercial - office and apartment buildings, hotels; >10-story heights - limited grass and trees; <15 percent vegetation.

- R2 - Compact Residential - single, some multiple, family dwellings with close spacing; generally <2-story; garages no driveway - limited lawn sizes and shade trees; <30 percent vegetation.

- R3 - Compact Residential - old multi-family dwellings with close lateral separation; generally <2-story; garages no driveway - limited lawn sizes, old established shade trees; <35 percent vegetation.

A review of the land-use and geography of the area around the site indicated that the urban mode was the most appropriate for this analysis because much of the nearby land within 3.0 km was urban, residential, or industrial. The site is also near a major population center.

2.3.5 Model Inputs

The ISCPRIME Model is a versatile model both in terms of the physical phenomena that it can represent and the options that are available for model control and calculations. The regulatory default options applicable to the ISCST3 were used throughout all applications of the ISCPRIME Model. Table 2-7 presents a summary of the features that were set by the regulatory default option as well as other options that were selected for this analysis. All options in Table 2-7 were chosen to be consistent with the requirements of the detailed modeling analysis performed for Tier II permitting in Idaho.

TABLE 2-7. OPTIONS SELECTED IN THE ISCPRIME MODEL FOR TIER II EMISSIONS AT THE SARMC BOISE FACILITY

Option description
Regulatory default option.
Concentrations in micrograms/cubic meter were computed.
Universal Transverse Mercator coordinates (UTMs) for the fence line and gridded receptor locations were used.
Terrain elevations were considered.
The Urban Mode option was selected.
Default wind profile exponent values were selected.
Default vertical potential temperature gradient values were selected.
The downwind distance plume rise option was used.
Buoyancy-induced dispersion was used.
The wind system measurement height was set to 6 meters (20 ft).
Building aerodynamic downwash was performed and included building information for the PRIME Model.
Stack tip downwash was modeled.
Program control parameters, receptors, and source input data were selected for output.
Concentrations during calm hours were set to zero.
Averaging times were selected consistent with those applicable to a Tier II NAAQS and AACC analysis.

2.3.6 Building Downwash

All plumes from the sources of emissions from the SARMC facility may be affected by nearby buildings and structures. Heights and locations for stacks, buildings, and other structures were included in the modeling analysis because building downwash of released emissions may influence the plumes (which will tend to bring the plumes closer to the ground near the structures).

The building and stack configuration of the SARMC Boise facility consists of 15 structures of varying heights and dimensions. The coordinates for these structures were entered into the BEEST Manager for ISCPRIME and BPIP-PRIME to graphically depict the structures and set up the input files for the downwash calculations. All building and structure outlines were shown in Figures 2-2 and 2-3.

2.3.7 Background Concentrations

When conducting NAAQS modeling for non-PSD sources (i.e. SARMC), sources not explicitly included in the model are taken into account by adding background concentrations. These concentrations were provided by DEQ. These included Nampa monitoring data for CO, Nampa and Meridian data for PM_{10}, Boise data for NO_2, and statewide data for SO_2. There are no background concentrations for the toxic air pollutants. Background concentrations and monitoring sites are noted below for each criteria pollutant for which an NAAQS concentration exists and was modeled.

PM_{10}	24-hour	95 µg/m^3	DEQ
	Annual	23 µg/m^3	DEQ
SO_2	3-hour	374 µg/m^3	Idaho, statewide average
	24-hour	120 µg/m^3	Idaho, statewide average
	Annual	18.3 µg/m^3	Idaho, statewide average
CO	1-hour	12,700 µg/m^3	Nampa, Idaho
	8-hour	5,726 µg/m^3	Lewiston, Idaho
NO_2	Annual	40 µg/m^3	Boise, Idaho
Lead	Monthly	0.15 µg/m^3	DEQ

2.4 Results of Ambient Impact Analysis

An ambient air quality impact analysis was conducted for all emission sources at the SARMC facility. The concentrations associated with each criteria and toxic pollutant for each averaging period were estimated using the ISCPRIME Model with a 5-year data set of meteorological data. The results are summarized in Tables 2-8 and 2-9 for the year or period for which the highest concentration occurred. For the annual periods, the highest concentration of each year was selected. For the averaging periods with short-term NAAQS, the highest second-highest concentrations were selected, except for PM_{10}. For PM_{10} a sequential 5-year meteorological data set was processed in the ISCPRIME Model and the highest sixth-highest concentration over all years at any one receptor was selected for comparison to the NAAQS for a 24-hour period. Background concentrations were included in the analysis for criteria pollutants. As Tables 2-8 and 2-9 show, all concentrations for criteria and toxic pollutants, including background, are less than the applicable NAAQS or AACC. As noted above, the TAP analysis goes beyond the minimum Idaho requirements by including all TAP emissions, not just the increases from new or modified sources.

TABLE 2-8. SUMMARY OF ISCPRIME MODELING RESULTS FOR CRITERIA POLLUTANTS

Pollutant	Averaging Period	Modeled Concentration, µg/m³	Background Concentration, µg/m³	Total Concentration (Modeled plus Background), µg/m³	NAAQS, µg/m³	Percent of NAAQS
PM_{10}	24-Hour[a,b]	23	95	118	150	78.4
PM_{10}	Annual[c]	9	23	32	50	64.3
SO2	3-Hour[a,b]	262	374	636	1,300	48.9
SO2	24-Hour[a,b]	158	120	278	365	76.2
SO2	Annual[c]	53	18.3	71	80	89.1
NOx	Annual[c]	6	40	46	100	46.3
CO	1-Hour[a,b]	177	12,700	12,877	40,000	32.2
CO	8-Hour[a,b]	124	5,726	5,850	10,000	58.5
Lead	Monthly[b]	0.00117	0.15	0.15117	1.5	10.1

[a]Refers to the highest sixth highest concentration over 5 years (1987-1991) for PM_{10} and highest second highest for all other criteria pollutants.
[b]Refers to concentration modeled using a maximum short-term emission rate.
[c]Refers to concentration modeled using an average long-term emission rate.

TABLE 2-9. SUMMARY OF ISCPRIME MODELING RESULTS FOR AIR TOXICS

Pollutant	Averaging Period	Maximum Modeled Concentration, $\mu g/m^3$	Background Concentration, $\mu g/m^3$	Total Concentration (Modeled plus Background), $\mu g/m^3$	AACC[a], $\mu g/m^3$	Percent of AACC
1,3-Butadiene	Annual	0.00002	0	0.00002	0.0036	0.6
Acetaldehyde	Annual	0.00031	0	0.00031	0.45	0.1
Arsenic	Annual	0.00003	0	0.00003	0.00023	13.0
Benzene	Annual	0.0005	0	0.0005	0.12	0.4
Beryllium	Annual	0.00001	0	0.00001	0.0042	0.2
Cadmium	Annual	0.0001	0	0.0001	0.00056	17.9
Chromium[b]	Annual	0.00002	0	0.00002	0.000083	24.1
Formaldehyde	Annual	0.00763	0	0.00763	0.077	9.9
Nickel	Annual	0.00019	0	0.00019	0.0042	4.5

[a]Acceptable Ambient Concentrations for Carcinogens (AACC) were taken from IDAPA 58.01.01.586 and are based on an annual average.
[b]Refers to Chromium VI.
[c]All concentrations modeled using an average long-term emission rate.